LMMB Data Tracking

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LMMB Data Tracking

I. Actual Datasets
(organized by Focus Group)

II. Data Verification and Validation Process

III. Data Availability and Release Policies

IV. LMMB Publications

LMMB Data Tracking

Data Verification

QC Coordinator

RDMQ Verification

Principal Investigator

PI changes/ new versions

Data Validation

sent to PI for review

EPA Great Lakes National Program Office

GLENDA

Modelers (Primary Users)

Data Releases

Secondary Users (Govt. agencies, etc.)

Release to General Public (TBA)

LMMB Data

43 Focus Groups of LMMB Data

- Atrazine - 4
- PCB/tNona - 8
- Mercury - 6
- Nutrients & Conventionals - 11
- Metals - 6
- Biological - 6
- Enhanced Monitoring Project - 5

Verification vs. Validation

Data Verification

process of reviewing data to determine how it compares to **internal measures**

Data Validation

process of reviewing data to determine how it compares to **natural environment**

Organization	Investigator	Matrix	Focus	Samples Collected-Analyzed	Field Data Submitted	Lab Data Submitted	Data Submission Complete	Pre-RDMQ Process	RDMQ Process	Data Verification Target Date	Data Verified	Date Data Sent to PI	PI Approval Date	Data Sent to Modelers	Most Recent Version	Version Currently Posted on Earth One
ATRAZINE																
ISWS	Sweet	Vapor/air	WSAA01	832	C	C	9/15/97	C	C	10/31/97	11/26/97	12/15/97	2/15/98	2/19/98	3	3
IU	Hites\Ilora	Vapor/air	IUAA01	111	C	C	5/21/97	C	C	10/31/97	11/26/97	11/26/97	2/15/98	2/19/98	4	4
Rutgers	Eisenreich	Open Lake	RULA	296	C	C	12/1/95	C	C	5/21/97	4/30/97	6/6/97	6/15/98	6/15/97	3	3
Rutgers	Eisenreich	Tribs	RUTA	114	C	C	2/14/97	C	C	5/21/97	5/14/97	6/6/97	6/15/98	6/15/97	2	2
PCB's/TRANS-NONACHLOR																
Battelle	Crecelius	Open Lake	BALP	837	C	C	11/24/97	C	S	2/1/99						
WSLH	Sonzogni	Tribs	LHTP	405	C	C	12/22/97	C	C	7/31/98	8/14/98	8/31/98	3/12/99	3/22/99	3	3
UMN	Swackhamer	Plankton (PCB)	MNPP	432	C	C	8/1/98	C	S							
UMN	Swackhamer	Plankton (T-nona)	MNPP	432	C	C	8/1/98	C	S							
ISWS	Sweet	Vapor/Air	WSAP01/02	832	C	C	6/30/97	C	C	9/18/98	9/24/98	12/3/98	2/17/99	3/19/99	3	2
ISWS	Sweet	Precipitation	WSAP03	832	C	C	10/31/97	C	C	9/18/98	9/24/98	12/3/98	2/17/99	3/19/99	3	2
ISWS	Sweet	Air	WSAP04	832	C	C	10/31/97	C	C	9/18/98	9/24/98	12/3/98	2/17/99	3/19/99	3	2
IU	Hites	Vapor	IUAP01/02	111	C	C	5/30/97	C	P	1/20/99	4/20/99	4/21/99			1	1
IU	Hites	Precipitation	IUAP03	111	C	C	5/30/97	C	P	3/5/99	4/20/99	4/21/99			1	1
IU	Hites	Filter	IUAP0X	111	C	C	5/30/97	C	P	3/5/99	4/20/99	4/21/99			1	1
Rutgers	Eisenreich	Air-Dry Dep	RUAP	131	C	C	9/15/97	C	P	3/15/99	3/31/99	4/1/99			1	1
NOAA	Van Hoof	Sediments (BOX, PNR)	NASP01	230	C	P	9/1/98	PI								
NOAA	Van Hoof	Sediment Traps	NASP02	145	P	P										
NBS	Hickey	Fish	BSFP	829	C	C	9/1/98	P	P							
MERCURY																
U.of Maryland	Mason	Open Lake	MDLH	160	C	C	5/1/96	C	C	1/23/98	1/25/98	1/28/98	4/5/98	4/17/98	2	2
UWWCL	Hurley	Tribs	WWTH	910	C	C	7/15/97	C	C	1/30/98	1/25/98	1/28/98	4/14/98	4/17/98	2	2
LLRS	Rossmann	Sediments	LLSH	193	C	C	4/15/98	C	C	7/31/98	7/16/98	7/16/98	8/11/98	8/14/98	2	2
UMN	Nater	Phytoplankton	MNPH	180	C	C	9/30/98	C	C	9/30/98	10/20/98	2/12/99			1	1
UMI	Nriagu	Fish	MIFH	190	P	C		P	P							
UMI	Keeler/Holsen	Atmospheric	MIAH	1880	C	C	10/15/97	C	C	1/30/98	2/7/98	2/15/98	4/5/98	4/17/98	3	3
NUTRIENTS & CONVENTIONALS																
GLERL [GLSN]	Johengen	Sediments (SiO_2, P)	GLSN01	277	C	C	7/14/97	C	C	2/19/99	3/9/99	3/31/99			1	1
GLERL [GLSN]	Johengen	Sediment Traps (SiO2, P)	GLSN02	97	C	C	3/1/99	C	C	2/17/99	3/9/99	3/31/99			1	1
GLERL [NASN]	Eadie	Sediments (C,N)	NASN01	230	C	P	3/1/99	P	P							
GLERL [NASN]	Eadie	Sediment Traps (C,N)	NASN02	145	P	C	3/31/99	P								
GRACE	Flynn	Air(Nutrients)	GRAN	387	C	C	11/1/97	C	C	4/8/98	4/13/98	4/13/98	4/13/98	4/17/98	2	2
GRACE	Flynn	Open Lake(nutrients)	GRLN	636	C	C	11/1/97	C	C	12/15/97	12/18/97	12/18/97	1/2/98	2/23/98	3	3
USGS	Hughes	Tribs (Board)	USTN	387	C	C	5/1/98	C	C	7/15/98	7/17/98	7/19/98	8/17/98	9/9/98	2	2
WSLH	Bowman	Tribs(N-P)	LHTN	300	C	C	9/30/98	C	C	1/31/98	2/2/98	2/11/98	5/1/98		3	3
UWWCL	Shafer	Tribs(DOC, POC)	WWTN	302	C	C	10/15/98	C	C	12/15/98	12/22/98	2/12/99			1	1
USEPA-GLNPO	Palmer	Open-Lake(Board)	GPLN	710	C	C	10/1/97	C	C	10/15/97	11/24/97	12/17/97	1/2/98	2/23/98	3	3
GRACE	Flynn	Open-Lake	BALN	837	C	C	3/24/98	C	C	3/28/98	4/13/98	4/13/98	4/13/98	4/17/98	2	2
GLNPO	Palmer	Open-Lake (Secchi)	GPLS	124	C	C	12/3/98	NA	NA	3/12/99	3/12/99	3/12/99	3/12/99	3/18/99	1	1
GLNPO	Warren	Open-Lake (Icarus-Seabird)	GPLI		C	C		NA	NA	3/19/99						

rganization	Investigator	Matrix	Focus	Samples Collected-Analyzed	Field Data Submitted	Lab Data Submitted	Data Submission Complete	Pre-RDMQ Process	RDMQ Process	Data Verification Target Date	Data Verified	Date Data Sent to PI	PI Approval Date	Data Sent to Modelers	Most Recent Version	Currently Posted on Earth One Version	Date Data Posted on Earth One	Modelers Notified
ACE METALS (RLP)																		
ACE	Flynn	Air (metals)	GRAM	44	C	C	11/1/97	C	P									
WS-RTP	Kellogg	Air (Metals (dry))	RTAM	532	C	C	1/10/97	P										
WS	Sweet/Talbott	Air (Metals (Wet))	WSAM	800	P	P		P										
SLH	Sonzogni	Tribs(metals)	LHTM	690	C	C	10/15/98	C	C	2/1/98	2/10/98	2/11/98	5/1/98		2		12/21/98	12/21/
	Holsen	Air (Metals)	IIAM	91	C	P	9/7/98	C	P									
WWCL	Shafer	Tribs (metals)	WWTM	1080	C	C	6/30/97	C	PI									
OLOGICAL																		
SLH	Bowman	Tribs(chlorophyll a)	LHTL	375	C	C	10/15/98	C	P	12/11/98	12/12/98	2/12/99	3/10/99	3/10/99	1	1	3/31/99	4/1/9
NPO	Warren	Open Lake(Chlorophyll a)	GPLL	255sf	C	C	5/15/98	NA	NA	8/1/98	4/1/99	4/1/99	4/19/99	4/19/99	1	1	4/19/99	
ACE	Flynn	Open-Lake (Prim. Prod.)	GRLY	105	C	C	9/1/98	NA	NA	NA	7/21/98	10/21/98	10/22/98	10/22/98	2	2	1/13/99	1/13/9
ACE	Flynn	Open Lake(Chlorophyll a)	GRLL	710	C	C	8/15/98	C	P	1/31/99								
ACE	Flynn	Open Lake Zooplank (species)	GRLZ01	56	C	C	9/15/98	NA	NA	1/31/99	2/1/99	2/19/99	3/23/99	3/24/99	3	3	4/19/99	4/19/9
ACE	Flynn	Zooplankton (groups.)	GRLZ02	98	C	C	9/15/98	NA	NA	2/10/99	2/19/99	2/19/99	3/23/99	3/24/99	3	3	4/19/99	4/19/9
ACE	Flynn	Open Lake Phytop (species)	GRLP01	46	C	C	9/15/98	NA	NA	1/31/99	4/20/99	4/20/99			1	1	4/20/99	
ACE	Flynn	Phytoplankton (groups)	GRLP02	88	C	C	9/15/98	NA	NA	3/30/99	4/20/99	4/20/99			1	1	4/20/99	
FWS	Holey	Coho diet	FSDB	1567	**NA**	**NA**		NA	NA									
S	Gannon	Trout diet	BSDB	1875	**NA**	**NA**		NA	NA									
S	Gannon	Forage Fish diet	BSDB	1344	**NA**	**NA**		NA	NA									
hanced Monitoring Project (RLP)																		
WS	Sweet	Vapor	WSAU01	832	~	~												
WS	Sweet	Precip	WSAU02	832	~	~												
WS	Sweet	Filter	WSAU03	832	~	~												
WS	Sweet	Vapor	WSAP01	832	C	C	6/30/97	C	C	9/18/98	9/24/98	12/3/98	2/17/99	3/19/99	2	2	3/23/99	3/19/9
WS	Sweet	Precip	WSAP02	832	C	C	10/31/97	C	C	9/18/98	9/24/98	12/3/98	2/17/99	3/19/99	2	2	3/23/99	3/19/9
WS	Sweet	Filter	WSAP03	832	C	C	10/31/97	C	C	9/18/98	9/24/98	12/3/98	2/17/99	3/19/99	2	2	3/23/99	3/19/9
	Hites	Vapor	IUAU01	111	C	C	6/16/98	C	P									
	Hites	Precip	IUAU02	111	C	C	8/19/98	C	P									
	Hites	Filter	IUAU03	111	C	C	7/15/98	C	P									
	Hites	Vapor	IUAP01	111	C	C	8/20/98	C	P	3/5/99								
	Hites	Precip	IUAP02	111	C	C	8/20/98	C	P	3/5/99								
	Hites	Filter	IUAP03	111	C	C	8/20/98	C	P	3/5/99								
SLH	Sonzogni	Trib	LHTP	405	C	C	11/25/97	C	C	7/31/98	8/14/98	8/31/98	3/12/99	3/22/99	3	3	3/23/99	3/22/9
diochemistry																		
ERL	Robbins	(Cs-137)	NASR	1000	**NA**	**NA**		NA	NA									
VI Mil	Edgington	(Pb-210)	NASR	1000	**NA**	**NA**		NA	NA									

Mass Balance

AMPLE TRACKING SHEET KEY:

~ = Currently No Submission
P = In Process
C = Complete
NA=Data not to be submitted for RDMQ Verification Process
PI=Verification of the focus is on hold until PI response to inquiries is obtained
S = Syd Allan is writing flagging rules and/or loading/flagging the data

AB OR FIELD DATA SUBMITTED: Data Submitted to GLNPO in any format
E-RDMQ PROCESS: Includes Data into Data Standard Format, into RDMQ format, RDMQ pre-check program run and errors resolved
DMQ PROCESS: Includes Data loaded into RDMQ, run through RDMQ as many times as needed. Report processed with discrepancies.
ATA VERIFIED: All activities post-RDMQ where all flagged data is verified and errors resolved with the PI.
ATA SENT TO MODELERS: Data sent to modelers for their use. This does not necessarily mean all other data steps have been completed.

ase send all changes to the Datastat.xls editor: Lucy Stanfield File location:G:\user\share\massbal\data\datastat.xls

LMMB Data Tracking: Important Events

- Date of Verification
- Date Posted on Earth One Server
- Date Sent to PI
- Date PI approved verified dataset
- Date Sent to Modelers
- Most Recent Version
- Version Currently Posted on Earth One
- Date Modelers Notified of Most Recent Version

Example focus group: Atmospheric Atrazine

Organization	Investigator	Matrix	Focus	Samples Collected-Analyzed	Field Data Submitted	Lab Data Submitted	Data Submission Complete Date	Pre-RDMQ Process	RDMQ Process	Data Verification Target Date
IU	Hites\Ilora	Vapor/air	IUAA01	111	C	C	5/21/97	C	C	10/31/97

Data Verified	Date Data Sent to PI	PI Approval Date	Data Sent to Modelers	Most Recent Version	Version Currently Posted on Earth One	Date Data Posted on Earth One	Date Modelers Notified
11/26/97	11/26/97	2/15/98	2/19/98	4	4	7/17/98	7/17/98

Status of LMMB Data

- 28 Focus Groups Verified (64%)
  - Atrazine (100%)
  - PCB's/tNona (50%)
  - Mercury (83%)
  - N&C (82%)
  - Metals (17%)
  - Biologicals (83%)
  - Enhanced Monitoring Project (60%)
- 22 FG Sent to Modelers (50% of total)

LMMB Data Release Policies

- Preliminary data
- Verified data - modelers
- Overall release of data
  - State and Federal Agencies
  - International Agencies
  - Consulting Firms
  - General Public
- Method of release: E-mail or FTP

Anticipated users of LMMB data:

- Lakewide Management Teams (LaMPs), Remedial Action Plan committees, and government/non-government entities focused on developing load reduction strategies

"The database will also be accessible to anyone who can benefit through the use of high-quality toxic data."

(from LMMB Data Release Guideline, GLNPO 1995)

Data Release Policy-Preliminary Data

- Definition: *data which have not been verified through the Research Data Management and Quality Control System (RDMQ)- raw data*
- Released, upon request, by the Principal Investigators only
- FOIA exempts specific types of information from release

  -To apply: PIs must request confidentiality of the data
- The request for confidentiality should accompany any data submittal to GLNPO as well as any preliminary data release.

(from LMMB Data Release Guideline, GLNPO 1995)

Data Release Policy - Verified Data

- After verification through RDMQ, verified and validated version 2 of the data is released to modelers

- Any publication by the modelers must be in cooperation or collaboration with the appropriate Principal Investigator(s).

  (from LMMB Data Release Guideline, GLNPO 1995)

- Datasets are released using 2 methods :
  - FTP through Earth 1 EPA site
  - E-mail attachment

Data Release Policy-Overall Release

- After verification, and before general availability, EPA will release the data only with agreement from the Principal Investigator, and with a request for confidentiality (Data Release Form)

- PIs must give GLNPO a date to allow overall release of the data
  - Guideline suggests one or two years (less if possible) from the initial date of submittal
  - Allows PIs to publish data before it becomes generally available
- Potential Method of Release: GLNPO Website

Secondary User Requests

Since December 1997:

- 14 separate requests received in GLNPO
- Requested Datasets
  - Atrazine: all media
  - Tributary and Atmospheric Mercury
  - Open Lake Nutrients
  - All Tributary Data
  - All PCB Data

Secondary User Requests

- **Who is requesting LMMB Data?**
  - State and Federal Agencies(EPA offices, MI DEQ, WI DNR)
  - International Agencies (IJC, Canadian Forest Service)
  - University Scientists and Consulting Firms (1 FOIA request)

- **Future Releases/Requests**
  - Public access via GLNPO website
    - Formatting & Security issues
  - All summary documents and data analyses will be made available to those who request it both via the Internet and through the mail

LMMB Data Release Form

- Name and Contact Information
- Date of Request
- Specific Data Requested
  - *List Focus Groups or describe study, analyte, media, geography*
- Intended Use for Data
- Requires 2 signatures before release
  - Project Officer for requested focus group
  - LMMB Management Chair or Technical Director

LMMB Publications

- GLNPO-LMMB documents
  - Workplan, QA Plan, Modeling QA Plan
  - Methods Compendium (Vols.1-3)
- Journal Articles
  - 6 in Environmental Science & Tech.
  - 2 in Journal of Great Lakes Research

LMMB Publications

Project Documents

U.S. Environmental Protection Agency. June 1997. *Lake Michigan Mass Balance Study (LMMB) Methods Compendium Volume 1: Sample Collection Techniques*. Great Lakes National Program Office. EPA 905-R-97-012a, 403pp.

U.S. Environmental Protection Agency. June 1997. *Lake Michigan Mass Balance Study (LMMB) Methods Compendium Volume 2: Organic and Mercury Sample Analysis Techniques*. Great Lakes National Program Office. EPA 905-R-97-012b, 532pp.

U.S. Environmental Protection Agency. June 1997. *Lake Michigan Mass Balance Study (LMMB) Methods Compendium Volume 3: Metals, Conventionals, Radiochemistry, and Biomonitoring Sample Analysis Techniques*. Great Lakes National Program Office. EPA 905-R-97-012c, 505pp.

U.S. Environmental Protection Agency. October 1997. *Lake Michigan Enhanced Monitoring Quality Assurance Program Plan*. Great Lakes National Program Office. EPA 905-R-97-017, 134pp.

U.S. Environmental Protection Agency. October 1997. *Lake Michigan Mass Budget/Mass Balance Work Plan*. Great Lakes National Program Office. EPA-905-R-97-016, 145pp.

U.S. Environmental Protection Agency. May 1, 1998. *Quality Assurance Plan for Mathematical Modeling*. Draft Version 3.0. Office of Research and Development and Great Lakes National Program Office. 217pp.

LMMB Journal Articles

Franz, T.P., Eisenreich, S.J., Holsen, T. 1998. *Dry deposition of particulate polychlorinated biphenyls and polycyclic aromatic hydrocarbons to Lake Michigan*. **Environ. Sci. Technol**. 32(23): 3681-3688.

Hurley, J.P.; Shafer, M.M.; Cowell, S.E.;et al. 1996. *Trace Metal Assessment of Lake Michigan Tributaries Using Low Level Techniques*. **Environ. Sci. Tech**. 30(6): 2093-2098.

Hurley, J.P., S.E. Cowell, M.M. Shafer, P.E. Hughes. 1998. *Partitioning and transport of total and methyl mercury in the Lower Fox River, Wisconsin*. **Environ. Sci. Technol.** 32(10): 1424-1432.

Madenjian, C., Hesselberg, R., Desorcie, T., Schmidt, L., Stedman, R., Begnoche, L., Passino-Reader, D. 1998a. *Estimate of Net Trophic Transfer of PCBs to Lake Michigan Lake Trout from Their Prey*. **Environ. Sci. Tech**. 32(7): 886-891.

Madenjian, C., Elliot, R., Hesselberg, R., Desorcie, T., Schmidt, L., Begnoche, L., Quintal, R., Bouchard, P., Holey, M. 1998b. *Net Trophic Transfer Efficiency of PCBs to Lake Michigan Coho Salmon from Their Prey*. **Environ. Sci. Tech.** 32(20): 3063-3067.

Madenjian, C., DeSourcie, T., Stedman, R., Brown, Jr., E., Eck, G., Schmidt, L., Hesselberg, R., Chernyak, S., Passino-Reader, D. 1999. *Spatial Patterns in PCB Concentrations of Lake Michigan Lake Trout*. **J. Great Lakes Res.** 25(1): 149-159.

Mason, R.P.; Sullivan, K.A. 1997. *Mercury in Lake Michigan*. **Environ. Sci. Tech**. 31(3): 942-47.

Rygwelski, K., Richardson, W., and D. Endicott. 1999. *A Screening-Level Model Evaluation of Atrazine in the Lake Michigan Basin*. **J. Great Lakes Res.** 25(1): 94-106.

Ongoing/Future Concerns

- Continuous Archival of Datasets
  - backup on hard drive & zipdisks
- Making GLENDA operational
- Updating GLNPO-LMMB webpages
- Documenting Lessons Learned
  - for future monitoring projects

Questions

- How should GLNPO package the data?
  - inc. summary reports, QC reports, etc.
- What's the best way to make the LMMB Data accessible via GLNPO website?
  - Interim period
  - through GLENDA

LMMB: The Future

EPA Great Lakes
National Program Office

GLENDA

Data Releases

Modelers
(Primary Users)

Release to
General Public
(Internet)

Secondary Users
(Govt. agencies, etc.)